

METHODS OF MANUFACTURING INTEGRATED CIRCUIT DEVICES THAT  
INCLUDE A METAL OXIDE LAYER DISPOSED ON ANOTHER LAYER TO  
PROTECT THE OTHER LAYER FROM DIFFUSION OF IMPURITIES AND  
INTEGRATED CIRCUIT DEVICES MANUFACTURED USING SAME

**Abstract of the Disclosure**

Integrated circuit devices are manufactured by exposing at least a portion of an insulation layer that comprises oxygen to a metal precursor that is reactive with oxygen so as to form a metal oxide layer on the portion of the insulation layer. The metal oxide layer may reduce the diffusion of impurities, such as hydrogen, into the insulation layer, which may degrade the electrical characteristics of the insulation layer.

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